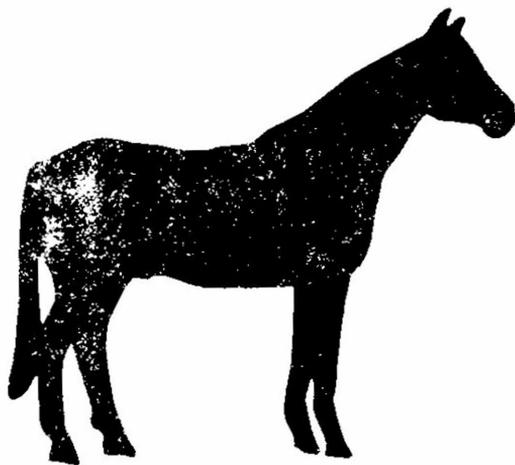
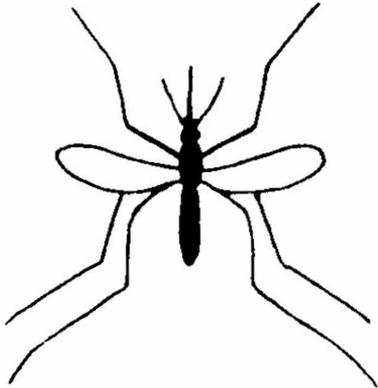


VEE ANNUAL SUMMARY 1972
Issued March 1973

CENTER FOR DISEASE CONTROL

VENEZUELAN EQUINE ENCEPHALITIS

SURVEILLANCE



ZOOONOSIS

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION

PREFACE

Summarized in this report is information received from State Health Departments, university investigators, virology laboratories, and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Any one desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the surveillance report are most welcome. Please address to:

Center for Disease Control
Attn: Office of Veterinary Public Health Services
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Atlanta, Georgia 30333

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Center for Disease Control: Venezuelan Equine Encephalitis Surveillance
Annual Summary, Issued March 1973

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1. SUMMARY

There were no reported cases of Venezuelan equine encephalitis (VEE) in equines in the United States in 1972, nor was the virus isolated from mosquitoes as a part of surveillance activities. Two human VEE cases were imported from Mexico, both of which were reported from California. There were several outbreaks of VEE reported from Mexico in 1972. Surveillance activities by a number of cooperating federal, state, and local agencies to monitor possible VEE activity in mosquitoes, equines, and other species will continue in the next mosquito season at a somewhat reduced rate.

11. INTERNATIONAL NOTES

A. VEE Mexico, 1972

1. VEE Outbreaks. Several VEE outbreaks were reported from Mexico for 1972. The 1st cases were reported from the State of Durango, adjacent to areas where the disease was active in 1971. Serum specimens from 26 acutely ill equines were collected June 2 in the eastcentral part of the State of Durango (Figure 1). An epidemic strain of VEE virus was identified from 8 of the samples. By early July, VEE had been reported by livestock officials in the Mexican States of Durango, Nayarit and Guerrero. In the State of Morelos, equine deaths from encephalitis were reported. However, there were no differential diagnoses attempted. Vaccination activities in the State of Sinaloa suggested virus activity in that area. On August 9, blood samples from 7 race horses were collected in Navajoa, Sonora, Mexico, and epidemic VEE virus was isolated from 2 samples. Equine cases were reported in and around Huatabampo, Obregon, Guaymas and to within an area 40 miles west of Hermosillo, Sonora, but not all cases were laboratory confirmed. Approximately 1,000 equines died in the outbreak in Sonora. Eight human deaths were attributed to the disease from an undetermined number of cases in Sonora. In September the disease ceased its northward spread. There was no evidence of VEE cases North of Hermosillo which is approximately 165 miles south of the Arizona-Mexico border.

2. Control Measures in Sonora. In early August when equine cases appeared in Sonora, a Technical Committee was established for surveillance and reporting. Surveillance data were collected weekly from 16 locations in southern Sonora concerning equine and human disease. Approximately 50,000 of an estimated 55,000 equines in southern Sonora had been vaccinated prior to the VEE outbreak in early August 1972. By mid-September almost 88,000 equines had been vaccinated in the entire state.

Aerial application of ultra low volume Malathion as well as surface application of insecticides were used for mosquito abatement in Sonora.

3. Vector Surveillance. At the invitation of the Mexican government, U. S. Department of Agriculture observers were sent to study vectors, wild mammals and birds, and their relation to the outbreak.

In August 1972, a VEE virus, characterized as a vaccine strain, was isolated from Psorophora fonninis mosquitoes. The isolate was collected in the Icuris area in the State of Sonora from mosquitoes trapped during an extensive equine vaccination program and represents the 2nd instance of such an occurrence. The 1st isolation was made in Basile, Louisiana, in 1971, and also was isolated from P. fonninis.

Editorial Note: This is the 2nd documented instance in which vaccine has apparently produced a viremia sufficiently high to infect a highly efficient vector species of mosquitoes.

4. Over-Wintering Studies. After September, VEE retreated south and was isolated from specimens collected November 17, 1972, from 2 horses of a group of 6 located in Delegacion de Milpa Alta, Distrito Federal, Mexico. One other isolate was made from specimens collected November 25, 1972, from 6 horses in Pueblo de Iacahua, Oaxaca,

B. VEE in Guatemala, 1972

In June 1972, encephalitis was diagnosed in horses along the northwest coast of Guatemala. A virus was isolated but not identified at that time. Over 7,000 equines were vaccinated against VEE.

(Reported by Dr. Pedro Acha, Pan American Health Organization, Washington, D. C.)

C. VEE in Ecuador, 1972

In mid-February 1972, VEE appeared in horses and humans in the town of Playas and had spread to other towns in the area by mid-March. At least 200 equine deaths and 33 human cases with no deaths were reported. VEE virus was isolated from 15 humans and 6 equines. The outbreak was brought under control in April 1972, using modified live virus vaccine obtained from Mexico.

(Reported by Dr. Ernesto Gutierrez V., Chief, Virus Section, National Institute of Hygiene, Guayaguil, Ecuador, and Arbovirology Unit, Laboratory Program, CDC.)

D. Arbovirus Activity - Peru and Nicaragua 1972

In the late spring of 1972, arboviral activity was reported in Peru and Nicaragua, but the type of virus was not identified.

(Source: Colonel Dan Crozier, Animal Assessment Division, U. S. Army, Fort Detrick, Maryland and Monthly Encephalitis Surveillance for the Americas, Report Vol. I, No. 6, June 1972, Centro Pan American de Zoonosis, Ramos Mejia, Prov. de Buenos Aires, Argentina.)

III. United States

A. Texas

In 1972, over 5,700 wildlife specimens were collected as part of a program to study the possible establishment of VEE in this country. Serum specimens from 4 coyotes from a total of 339 domestic and wild canines in Texas had VEE SN titers ranging from 1:10 to 1:100; no VEE virus was isolated. There were 66 equine encephalitis investigations conducted in horses, and 5 cases of western equine encephalitis (WEE) were diagnosed.

The various state and federal agencies in Texas plan to continue to monitor wildlife in the border area, trap mosquitoes, and place some hamster sentinels in selected areas in the coming mosquito season. A fullscale information program on the VEE vaccination of horses is planned.

(Reported by Dr. Jack Pitcher, Assistant Veterinarian in Charge, USDA, Austin, Texas, and Dr. A. B. Rich, State Public Health Veterinarian, Division of Veterinary Medicine, State Department of Health, Austin, Texas.)

B. California

In 1972 there were 2 human cases of VEE imported from Mexico. Both patients were heavily exposed to mosquitoes in areas in Mexico reporting virus activity in equines and man. One case was in a tourist and the other in an entomologist studying VEE in insects. One case was confirmed by virus isolation. The other case had not been vaccinated against VEE, but had serum antibodies against VEE and a clinical history compatible with VEE infection. No clinical disease compatible with VEE developed in family or close contacts of these 2 cases.

In 1972, there were 6,336 pools of mosquitoes and other Diptera (over 194,737 individual insects) tested by the Arbovirus Surveillance Program, California State Department of Public Health. There were 48 isolates of Turlock virus, 64 of SLE virus, 42 of WEE virus, and 26 of unidentified viruses which were none of the commonly found arboviruses and may be new agents. California has reported 68 clinical suspect equine cases of encephalitis; only 1 case, in a 3-year-old gelding, was confirmed as WEE (July 24, 1972).

There were 10 reported cases of human encephalitis caused by arboviruses in California in 1972; 3 were caused by WEE, 5 by SLE, and 2 by VEE, both of which were imported from Mexico. There were no deaths.

(Reported by Dr. Richard W. Emmons, Public Health Physician, California Department of Health, Berkeley, California.)

C. Kansas - 1972

The Kansas State Department of Health placed 8 sentinel chicken flocks (120 chickens each) throughout the state to monitor arbovirus activity; 6 sites were used for mosquito trapping. SLE and WEE antibodies were demonstrated in 3 flocks; 3 flocks had WEE antibodies; and 2 flocks were negative for evidence of arboviruses. Over 5,000 mosquitoes (125 pools) were tested; 19 WEE and 3 SLE virus isolations were made from these pools.

Equine surveillance was monitored by a report card system from licensed veterinarians throughout Kansas. There were 91 equine encephalitis investigations for the year; 71 were diagnosed as WEE.

(Source: Yearly Report, Encephalitis Surveillance, 1972, Kansas State Department of Health, Division of Epidemiology, November 8, 1972.)

IV. Federal Activities, 1972

A. USDA and CDC Surveillance Activities

For the calendar year 1972, 162,063 mosquitoes (3,958 pools) were tested by the Arboviral Diseases Section, EIP, CDC, Fort Collins, Colorado; 289 arboviral agents were isolated from several mosquito species, but no VEE virus was detected from mosquitoes. However, 138 of the isolates have been identified as WEE virus, 36 as Turlock virus, 10 as SLE virus, 5 as Bunyamwera group viruses, 3 as California group viruses, and 97 as other viruses.

A total of 177 serum samples were collected from 30 burros at 22 equine sentinel sites in the 6-state area of Arizona, Colorado, Louisiana, Texas, Oklahoma, and New Mexico. No VEE virus was isolated nor were there any serologic conversions to VEE antibody.

For 1972, 1,041 equine encephalitis investigations were conducted by cooperating state-USDA agencies in the United States. Table 1 shows the investigations and vaccinations by state. USDA reported 215,079 equine VEE vaccinations in 1972.

B. Wildlife Studies

In 1972 approximately 9,000 wildlife samples were tested for VEE antibodies and/or virus. These were collected by various state and local agencies, U. S. Department of Agriculture, U. S. Department of Interior, and personnel under the supervision of the Department of Defense. Species sampled included domestic animals and various wildlife species from the entire United States. Table 2 shows the location from which specimens were collected. In addition to the 4 coyotes serologically positive for VEE reported from Texas, there was 1 raccoon from which VEE antibodies were demonstrated from Collier County, Florida. Presumably the raccoon, collected in May 1972, was exposed to the endemic Florida VEE strain.

C. Special Survey

Because of the threat of VEE to the border areas in the Southwest in mid-July, CDC initiated a serologic survey of equines in Santa Cruz and Yuma counties, Arizona, and Dona Ana County, New Mexico, to assess the immunization status of equines in those areas (Figure 1). The Center for Disease Control, local health departments, U. S. Department of Agriculture, and U. S. Army personnel cooperated in conducting the survey. Randomly selected owners of 1,490 equines were interviewed for a vaccination history of their animals. Serum samples from 1/3 of the equines (446) were examined for VEE, WEE, and EEE antibodies.

A total of 1,181 (79.3%) of the horses had a definite vaccination history against VEE. Of 446 equines bled, 226 (50.7%) had both a history of VEE vaccination (including 20 revaccinated in 1972) and a serum neutralizing antibody titer against VEE. Of the remaining 220 equines with no neutralizing antibody titer for VEE, 197 (89.5%) had a history of VEE vaccination (including 5 revaccinated in 1972), 14 (6.4%) had no history of vaccination, and for 9 (4.1%) the vaccination history was unknown. In a preliminary study conducted by CDC of horses vaccinated against VEE in 1971, 89.1% (41/46) had neutralizing antibody titers against VEE 11 months after vaccination.

Further analysis of the data showed there were 220 equines with no VEE titers, 169 (76.8%) had both WEE and EEE titers, 31 (14%) had WEE titers only, 3 (1.4%) had EEE titers only and 17 (7.7%) had no titers to VEE, WEE, or EEE. Of the 226 equines with VEE titers, 110 (48.7%) had both WEE and EEE titers, 34 (15.9%) had WEE titers only, 8 (3.6%) had EEE titers only, 65 (28.8%) had no titers to WEE or EEE, and 7 (3.1%) did not have observations made for WEE or EEE titers.

There appears to be an inverse relationship between the presence of WEE and/or EEE antibodies and VEE antibodies. Upon closer analysis the interference appears to be from pre-existing WEE antibodies. It is well known that WEE is endemic in the surveyed area. Because of this, vaccination of equines against both EEE and WEE is commonly practiced. It is, therefore, very difficult to determine when equine WEE antibodies were developed in relation to the time of VEE vaccination. Another problem in making conclusions about the relationship between the two antigens is whether the WEE antibodies were due to natural exposure or artificially as the result of vaccination.

Because of the above mentioned data and the presence of VEE in Mexican border states, the U. S. Department of Agriculture recommended VEE vaccination of all equines and revaccination of previously vaccinated horses in threatened areas.

D. VEE surveillance, 1973

Proposed surveillance for the coming mosquito season includes cooperation between the Center for Disease Control, U. S. Department of Agriculture, and the various state health and animal disease control groups to trap and bleed wildlife and investigate equine encephalitis cases throughout the United States. An information program on equine VEE vaccination, especially in high risk areas, will be developed by the U. S. Department of Agriculture and local agencies.

U. S. Department of Agriculture efforts, with the cooperating states, will be aimed at equine encephalitis investigations, information programs to encourage equine vaccinations, collection of mosquitoes in the southwestern states, possible sentinel animal activity, and a readiness to respond to VEE virus movements as may be determined through surveillance.

As conditions permit, in cooperation with other governments in South and Central America, CDC-USDA groups will attempt to elucidate the interepidemic maintenance of epidemic VEE viruses. Personnel participating in this activity will be entomologists and medical and veterinary epidemiologists. It is planned that CDC laboratory services for confirmation of VEE virus isolations will be available at Fort Collins, Colorado, and Atlanta as well as other services as may be needed.

The Office of Veterinary Public Health Services will maintain close and frequent contacts with state and local agencies. VEE Surveillance Reports will continue to be published as often as the situation demands.

Table 1
 Reported Equine Encephalitis Investigations* and VEE Vaccinations,
 United States, 1972

State	Vaccinations	Investigations	Positive VEE
Alabama	48	4	
Alaska	0	0	
Arizona	101	4	1
Arkansas	206	4	
California	4160	68	1
Colorado	6444	101	76
Connecticut	4566	11	
Delaware	97	4	
Dist. of Columbia	0	0	
Florida	3032	11	
Georgia	550	6	
Hawaii	14	1	
Idaho	2595	31	15
Illinois	0	25	5
Indiana	4058	14	1
Iowa	6	38	16
Kansas	2546	91	71
Kentucky	1142	1	
Louisiana	626	14	
Maine	41	3	
Maryland	532	11	
Massachusetts	357	2	
Michigan	8506	4	1
Minnesota	3548	124	84
Mississippi	7	16	
Missouri	72	1	1
Montana	193	43	29
Nebraska	5800	31	18
Nevada	4682	3	1
New Hampshire	494	0	
New Jersey	0	8	
New Mexico	864	14	3
New York	59,040	5	
North Carolina	708	32	1
North Dakota	602	29	21
Ohio	15,030	15	1
Oklahoma	1040	32	7
Oregon	6800	15	5
Pennsylvania	4744	3	
Rhode Island	0	6	
South Carolina	180	11	
South Dakota	346	54	38
Tennessee	378	5	
Texas	42,096	66	5
Utah	6826	2	
Vermont	4922	3	
Virginia	579	8	
Washington	2327	26	21
West Virginia	455	1	
Wisconsin	8935	0	
Wyoming	4784	40	21
TOTALS	215,079	1,041	443

*Through December 31, 1972

Table 2

Location From Which VEE Specimens Were Collected*, 1972

State	Cattle	Sheep Goats	Rabbits	Equines	Dogs	Other Mammals	Birds
Alabama	0	0		7	15		10
Arizona	1	4	80	3	401		34
Arkansas					2		
California					104		
Florida				80	26	15	534
Georgia	10			3	165	75	24
Louisiana		18	11	8	776	3	56
Maryland							10
Minnesota					59		
Mississippi					6		29
New Mexico	81			3	88	2	45
New York					69		
North Carolina							5
Ohio				50			
Oregon				2			
South Carolina					172		35
Texas	8	133	1,134	10	2,806	339	1,323
Utah	15		39	44	18		
TOTALS	34	236	1,264	210	4,707	434	2,105

GRAND TOTAL: 8,990

*Source: U. S. Department of Agriculture, Animal Plant Health Inspection Services, Hyattsville, Maryland.

STATE EPIDEMIOLOGISTS AND STATE PUBLIC HEALTH VETERINARIANS

Key to all disease surveillance activities are the State Epidemiologists, who are responsible for collecting, interpreting and transmitting data and epidemiologic information from their individual States. Their contributions to this report are gratefully acknowledged. In addition, valuable contributions to zoonoses surveillance reports are made by State Public Health Veterinarians.

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*Dual assignment